

## Retsef Levi - Curriculum Vitae

Associate Professor of Management  
MIT Sloan School of Management (Operations Management Group)

### PERSONAL

**Date of birth:** 03/07/71

**Place of birth:** Israel

**Languages:** Hebrew - mother-tongue; English - fluent, at mother-tongue level; Arabic - basic+ level.

**Citizenship:** Israel (holds a Green Card)

**Contact details:** Room E53-389, 50 Memorial Drive, Cambridge, MA 02142  
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### EDUCATION

**January 2002 – July 2005 -- Cornell University**  
**Ph.D. in Operations Research (ORIE Department)**  
GPA: 4.2368/4.3

**1996-1997 & 1999-2001 -- Tel-Aviv University**  
**B.Sc. in Mathematics, trend of Operation Research**  
Final Grade: 96 (out of 100), Summa cum Laude  
My B.Sc. studies were part of my service in the IDF (Israeli Defense Forces):  
1996-1997 First academic year completed  
1997-1999 Upon requests from IDF went back to active service  
1999-2001 Second and third academic years completed (graduated in July 2001)

### DOCTORAL THESIS

**Co-Advisors:** Robin Roundy and David Shmoys.

**Minor Advisors:** James Renegar (Applied Math) and Shane Henderson (Applied probability).

**Thesis:** "Computing Provably Near-Optimal Policies for Stochastic Inventory Control Models", under the supervision of Robin Roundy and David Shmoys

### RESEARCH INTERESTS

- Supply chain and inventory management
- revenue management
- Healthcare management
- Multistage Stochastic Optimization
- Data-driven algorithms
- Combinatorial optimization

(See more on my research at <http://web.mit.edu/retsef/www>)

### NON MIT EMPLOYMENT

**July 2005–August 2006**

**Herman Goldstine Postdoctoral Fellowship in the Department of Mathematical Sciences, IBM T.J. Watson Research Center, Yorktown Heights, NY**

**January 2002–July 2005**

**OR&IE Department, Cornell University, Ithaca, NY**

(Instructor of several courses)

**2001 - Business Development Consultant, Wisair Inc, Israel**

Wisair is an Israeli hi-tech start-up company (of the RAD Group), which develops wireless solutions based on Ultra Wide Band (UWB) technology. The position included initiating and leading the potential market analysis and business development: initiating and promoting three major funding channels from the European Commission (1m Euro), an Israeli venture capital company (\$5m), and the Israeli Chief Scientist

**1990-2001 - Officer in the Israeli Defense Forces (IDF)**

Since 1991, served as an Officer in an elite unit of the Intelligence Corps of the IDF. Filled different positions throughout the years, which involved highly complicated analysis of interdisciplinary projects. Work was identified by high pressure and required high level of creativity and original thinking.

1991-1994 - Intelligence Analyst Officer (analyzing technical intelligence material)

1994-1996 - Captain, Head of Section, supervising 8 soldiers and officers. Designated as an extra merit officer (received prize from IDF Intelligence Department)

1997-1999 – Major, Head of Section, supervising more than 25 soldiers and officers. Received prize for “Creative Thinking” (Awarded by the Head of the IDF Intelligence Corps)

1999-2001 – Tel-Aviv University

**MIT EMPLOYMENT**

**July 2009-**

**Associate professor (with tenure)**

**September 2006-June 2009**

**Robert N. Noyce Career Development Professor**

**Assistant Professor of Management, Sloan School, MIT, Cambridge, MA**

**(Affiliated with the Operations Research Center (ORC) and the Computations for Design and Optimization (CDO) program at MIT)**

**PROFESSIONAL ACTIVITIES**

**MIT Activities**

- Leading a collaborative research project between Sloan and Mass General Hospital (MGH) on various operational problems in the peri-operative care system. In the academic year 2008-2009, MGH and Sloan will jointly fund a postdoctoral fellow that will be supervised by me
- Member in the PhD admission committee of the Operations Research Center (ORC) (2007-2008 and 2010)
- Member of the Professional Standards Committee at Sloan, 2009-

- Member of several general exams committees of PhD students at the ORC
- Participating in the admission process of the Computation for Design and Optimization (CDO) Master program
- Member in the organizing committee of the 2009 MSOM conference that will take place at MIT

### Other Activities

- Area Editor in *Operations Research Letters*, (**January 2009 -** )
- Associate Editor in *Management Science*, (**January 2009 -** )
- Associate Editor in *Mathematics of Operations Research*, (**March 2009 -** )
- Associate Editor in *Naval Research Logistics*, (**May 2009 -** )
- Referee for Mathematics of Operations Research, Operations Research, Management Science, Manufacturing and Service Operations Management (MSOM), Naval Research of Logistics, Discrete Mathematics, European Journal of Operations Research, IEEE Transactions
- Judge in the 2006, 2007 and 2008 MSOM Student Paper Competitions
- Judge in the 2008 and 2009 Nicholson Competition
- Participating in National Science Foundation (NSF) panel (2008)
- INFORMS 2007 - Inventory Cluster Chair

### GRANTS AND AWARDS

- 2009 - NSF CAREER Award: "New Algorithmic Approaches to "Computationally Challenging Stochastic Supply Chain and Revenue Management Models" (\$400K). Grant duration: 2009-2014.
- 2008 - "Optimization Prize for Young Researchers", awarded by the Optimization Society, INFORMS (for the paper "A 2-Approximation Algorithm for Stochastic Inventory Control Models with Lost-Sales," Retsef Levi, Ganesh Janakiraman and Mahesh Nagarajan)
- 2008 - MIT, Sloan Outstanding Teaching Award
- 2008 - AFOSR Grant: An Optimization Framework for Air Force Logistics Models (\$522,000), with Tom Magnanti. Grant Duration: 2008-2011
- 2008 - Singapore-MIT Alliance (SMA): Data-Driven Algorithms (\$160K). With Georgia Perakis (MIT). Grant Duration: 2008-2010
- 2007 - NSF grant DMS-0732175: MSPA-MCS: Collaborative Research: Algorithms for Near-Optimal Multistage Decision-Making under Uncertainty: Online Learning from Historical Samples (\$172,330), with David Gamarnik (MIT), David Shmoys and Paat Rusmevichientong (Cornell University) and Tim Huh (Columbia University) Grant duration: 2007-2010
- 2007 - IBM Faculty Award (\$15K) - Awarded by the Department of Mathematical Sciences, IBM T.J. Watson Research Center, Yorktown Heights, NY
- 2006 - MIT Buchsbaum Grant (\$50K)
- 2005 - IBM Herman Goldstine Postdoctoral Fellowship in the Department of Mathematical Sciences, T.J. Watson Research Center, Yorktown Heights, NY
- 2004 - First Prize of the MSOM Student Paper Competition
- 2001 - Award for Excellence, BA Studies at the School of Mathematics in Tel-Aviv University.
- 1999 - Received the prize of the Head of Intelligence Corps for "Creative Thinking"
- 1996 - Designated as an Extra Merit Officer (by the Head of the IDF Intelligence Corps)

### PROFESSIONAL MEMBERSHIPS

- Institute of Operations Research and Management Science (INFORMS)
- Manufacturing and Service Operations Management (MSOM)

- Applied Probability Society (APS)
- Mathematical Programming Society (MPS)

## TEACHING

### Courses

**15.060 (Data, Models, Decisions)** – MBA course, Sloan School of Management (fall 2009)

**15.760 (Introduction to Operations Management)** – MBA course, Sloan School of Management, MIT (spring 2007, spring 2008)

**15.764 (The Theory of Operations Management)** – PhD course, Sloan School of Management (part of the Operations Research Center program), MIT (spring 2008)

**OR320/520 (Optimization 1)** – Undergraduate program of the ORIE Department, Cornell University (summer 2003, summer 2004)

**OR522 (Topics in Linear Optimization)** – Master of Engineering course, ORIE Department, Cornell University (fall 2003)

**OR115 (Introduction to Operations Research)** – Freshman year course, ORIE Department Cornell University (spring 2004)

### Students

**PhD Students:** Andre Calmon (ORC, Starting Fall 2009, co-supervised), Adam Al-Maktaub (ORC, starting Fall 2009), Shi Cong (ORC, 2nd year), Phillip Keller (ORC, 3rd year, co-supervised), Uichanco Joline Ann Villaranda (ORC, starting fall 2008, co-supervised), Eric Zarybnisky (ORC, 2<sup>nd</sup> year, co-supervised), Dan Stratila (ORC, graduated in fall 2008, thesis committee member)

**Master Students:** Uichanco Joline Ann Villaranda (CDO, graduated in summer 2007, co-supervised), Tinting Rao (CDO, graduating in summer 2008, co-supervised), Wongsakorn Chaiwanon (ORC, 3rd year, co-supervised),

**Undergraduate Students:** Luwen Huang (UROP, co-supervised), Katherine Lin (UROP student)

**Postdoctoral Fellow:** Danny Segev (2008-2009, co-supervised)

## PUBLICATIONS

### Theses

"Computing Provably Near-Optimal Policies for Stochastic Inventory Control Models", under the supervision of Robin Roundy and David Shmoys (PhD Thesis)

## Refereed Journals

"A Model for Understanding the Impacts of Demand & Capacity on Waitlists in a Congested Recovery Room", Tor Schoenmyer, Peter F. Dunn, David Gamarnik; Retsef Levi, David L. Berger, Bethany J. Daily, Wilton C. Levine, and Warren S. Sandberg, *Anesthesiology*, Volume 110(6), pages 1293-1304, June 2009

"Revenue Management of Reusable Resources - Provably Near-Optimal LP-Based Policies," Retsef Levi and Ana Radovanovic, 2007 (To appear in *Operations Research*)

"LP-based Approximation Algorithms for Capacitated Facility Location", Retsef Levi, David Shmoys and Chaitanya Swamy. (To appear in *Mathematical Programming*, extended abstract appeared in IPCO 2004)

"Approximation Algorithms for Capacitated Stochastic Inventory Models", Retsef Levi, Robin Roundy, David Shmoys and Van Anh Truong, *Operations Research*, volume 56(5), pages 1184-1199, September-October 2008

"Approximation Algorithms for the Multi-Item Capacitated Lot-Sizing Problem Via Flow-Cover Inequalities", Retsef Levi, Andrea Lodi and Maxim Sviridenko, *Mathematics of Operations Research*, Volume 33 (2), pages 461-474, May 2008

"A 2-Approximation Algorithm for Stochastic Inventory Control Models with Lost-Sales," Retsef Levi, Ganesh Janakiraman and Mahesh Nagarajan, *Mathematics of Operations Research*, Volume 33 (2), pages 351-374, May 2008 (This paper was awarded the "2008 Optimization Prize for Young Researchers" by the Optimization Society, INFORMS)

"First Constant Approximation Algorithm for the One-Warehouse-Multi-Retailer Problem", Retsef Levi, Robin Roundy, David Shmoys and Maxim Sviridenko. *Management Science*, Volume 54, pages 763-776, April 2008

"Provably Near-Optimal Sampling-Based Policies for Stochastic Inventory Control Models", Retsef Levi, Robin Roundy and David Shmoys, *Mathematics of Operations Research*, Volume 32 (4), pages 821-838, November 2007

"Approximation Algorithms for Stochastic Inventory Control Models", Retsef Levi, Martin Pál, Robin Roundy and David Shmoys, *Mathematics of Operations Research*, Volume 32 (2), pages 284-302, May 2007. This paper was awarded first prize in the 2004 MSOM Student Paper Competition

"Algorithms for Capacitated Rectangle Stabbing and Lot-Sizing with Joint Set-Up Costs", Guy Even, Retsef Levi, Dror Rawitz, Baruch Schieber, Shimon (Moni) Shahar and Maxim Sviridenko, *ACM Transactions on Algorithms*, Volume 4, Article No. 34, 2008

"Primal-Dual Algorithms for Deterministic Inventory Problems", Retsef Levi, Robin Roundy and David Shmoys. *Mathematics of Operations Research*, Volume 31, pages 267-284, February 2006

## Refereed Conferences

"Online Make-to-Order Joint Replenishment Model: Primal-Dual Competitive Algorithms (Extended Abstract)", Niv Buchbinder, Tracy Kimbrel, Retsef Levi, Konstantin Makarychev and Maxim Sviridenko, *SODA 2008*, pages 952-961, 2008

"Approximation Algorithms for the Multi-Item Capacitated Lot-Sizing Problem via Flow-Cover Inequalities (Extended Abstract)", Retsef Levi, Andrea Lodi and Maxim Sviridenko, Proceedings of IPCO 2007, pages 454-468, 2007

"Improved Approximation Algorithms for the One-Warehouse-Multi-Retailer Problem (Extended Abstract)", Retsef Levi and Maxim Sviridenko, Proceedings of APPROX 2006, pages 188-199, 2006

"Provably Near-Optimal Balancing Policies for Multi-Echelon Stochastic Inventory Control Models", Retsef Levi, Robin Roundy and Van Anh Truong, (Presented in the 2006 Multi-Echelon Conference)

"Provably Near-Optimal Sampling-Based Policies for Stochastic Inventory Control Models (Extended Abstract)", Retsef Levi, Robin Roundy and David Shmoys, Proceedings of the 38th Annual ACM Symposium on Theory of Computing, pages 739-748, 2006

"Approximation Algorithms for Stochastic Inventory Control Models (Extended Abstract)", Retsef Levi, Martin Pál, Robin Roundy and David Shmoys, Proceedings of IPCO 2005, pages 306-320

"Inventory and Facility-Location Models with Market Selection (Extended Abstract)", Retsef Levi, Joseph Geunes, Edwin Romeijn and David Shmoys, Proceedings of IPCO 2005, pages 111-124

"First Constant Approximation Algorithm for the One-Warehouse-Multi-Retailer Problem (Extended Abstract)", Retsef Levi, Robin Roundy and David Shmoys, Proceedings of SODA 2005, pages 365-374

"Primal-Dual Algorithms for Deterministic Inventory Problems (Extended Abstract)", Retsef Levi, Robin Roundy and David Shmoys, Proceedings of the 36th Annual ACM Symposium on Theory of Computing, pages 353-362, STOC 2004

"LP-Based Approximation Algorithms for Capacitated Facility Location (Extended Abstract)", Retsef Levi, David Shmoys and Chaitanya Swamy, proceedings of IPCO 2004, pages 206-218

"Facility Location with Service Installation Costs (Extended Abstract)", David Shmoys, Chaitanya Swamy and Retsef Levi, proceedings of SODA 2004, pages 1081-1090

### **Submitted Papers**

"Near-Optimal Algorithms for Assortment Planning under Dynamic Substitution and Stochastic Demand", Vineet Goyal, Retsef Levi, and Danny Segev, 2009 (Submitted to Operations Research)

"Concave Formulations for Multi-Product Pricing with Attraction Demand Models", Phil Keller, Retsef Levi, Georgia Perakis

"Inventory and Facility-Location Models with Market Choice", Retsef Levi, Joseph Geunes, Edwin Romeijn and David Shmoys. (Submitted to Mathematical Programming, extended abstract appeared in IPCO 2005 – Minor Revision)

"Provably Near-Optimal Balancing Policies for Stochastic Multi-Echelon Inventory Control Models", Retsef Levi, Robin Roundy and Van Anh Truong, 2006 (Submitted to Operations Research - Revised).

"Adaptive Data-Driven Inventory Control Policies Based on Kaplan-Meier Estimator", Tim Huh, Retsef Levi, Paat Rusmevichientong and Jim Orlin, 2008 (Submitted to Operations Research – Revised & Resubmitted)

### **Papers in Preparation**

"Near Optimal Algorithms for Assortment Planning Under Dynamic Substitution one Stochastic Demand" (Technion & Tel Aviv University, Israel, 2009).

"New Policies for Stochastic Inventory Control Models - Theoretical and Computational Results", Gavin Hurley, Peter Jackson, Retsef Levi, Robin Roundy and David Shmoys, 2006 (Soon to be submitted to MSOM)

"The Data Driven Newsvendor Problem – New Bounds and Insights", Retsef Levi, Georgia Perakis, Joline Uichanco, 2009

"On-line Primal-Dual Algorithms for Multi-Item Make-to-Order Inventory Models", Niv Buchbinder, Tracy Kimberl, Retsef Levi, Konstantin Makarychev and Maxim Sviridenko. (Soon to be submitted to Management Science)

"Sampling-Based Algorithms for Airline Revenue Management Problems", Tim Huh, Tiam Hai Lee and Retsef Levi. (Soon to be submitted to Operations Research)

"Dynamic Pricing with Learning – State-Space Collapse and Fully Polynomial Time Approximation Scheme", Vivek Farias, Retsef Levi, Jim Orlin and Georgia Perakis (Soon to be submitted to Operations Research)

"Provably Near-Optimal Sampling-Based Algorithms for Scheduling Surgeries", Mehmet Begen, Retsef Levi and Maurice Queyranne

"Cost Allocation and Games in Multi-Echelon Stochastic Inventory Control Models", Retsef Levi and Nicholas Stier.

"Data-Driven Approaches for Newsvendor Revenue Maximization Models", Retsef Levi, Georgia Perakis and Joline Uichanco

"Provably Optimal LP-Based Subgradient Algorithms for Joint Pricing and Inventory Control Problems", Elodie Adida, Retsef Levi and Georgia Perakis

"An Inventory Model with Partial Unobservable Lost-Sales", Roman Kapuscinski, Retsef Levi and Wenjing Shen

"The Box Property of Capacitated Stochastic Resource Allocation Problems", Tim Huh, Ganesh Janakiraman, Retsef Levi, Mahesh Nagarajan

"Approximation Algorithms for the Stochastic Lot-Sizing Problem", Retsef Levi and Cong Shi

## INVITED TALKS

"Non Parametric Data-Driven Policies for Stochastic Inventory Models" (Fuqua Business School, Duke University, 2009; Columbia Business School, Columbia University, 2009, IESE Business School - University of Navarra, 2009; Marshal School, USC, 2008; Cornell University, ORIE Department, 2007; Cornell University, Johnson School of Business, 2008; MSOM 2008; IBM, T.J. Watson Research Center, 2008, Operations Research Seminar, Tel-Aviv University, Israel, 2008; Department of Industrial Engineering and Management Science, Technion, Israel, 2008, Ross School of Business, Michigan, 2008)

"The On-Line Make-To-Order Joint Replenishment Model" (INFORMS 2007)

"Flow-Cover-Inequalities and The Multi-Item Capacitated Lot-Sizing Problem" (ORIE Department, Cornell University, 2007; Department of Industrial Engineering, Technion, Israel, 2007, IPCO 2007; INFORMS 2007)

"Provably Near-Optimal Dual-Balancing Policies for Stochastic Inventory Control Models with Lost-Sales" (MSOM 2006; INFORMS 2006; MSE Department, Stanford University 2006)

"Provably Near-Optimal Sampling-Based Policies for Stochastic Inventory Control Models" (INFORMS 2006; Sauder School of Business, University of British Columbia, 2006; The Business School of Chicago University, 2006; Computer Science Department of Columbia University, 2006; Operations Research Seminar, Tel-Aviv University, Israel, 2005; Department of Industrial Engineering and Management Science, Technion, Israel, 2005)

"Approximation Algorithms for Stochastic Inventory Control Models with Correlated and Evolving Demands" (The Industrial Engineering Department, Tel-Aviv University, Israel, 2007; The 2006 International Symposium of Mathematical programming (ISMP); IBM, Almaden 2006, IPCO 2005, INFORMS 2005, Workshop in Combinatorial Optimization, Oberwolfach, Germany, 2005)

"Improved Approximation Algorithms for the One-Warehouse Multi-Retailer Problem" (INFORMS 2006)

"Provably Near-Optimal Policies for Hard Stochastic Inventory Control Models" (IBM-NYU-Columbia Theory Day, 2005)

"The One-Warehouse Multi-Retailer problem – Improved Approximation Algorithms" (SODA 2005; INFORMS 2005)

"Inventory & Facility Location Models with Market Selection" (INFORMS 2005)

"The Joint Replenishment Problem – Primal-Dual Approximation Algorithms" (INFORMS 2004; STOC 2004)